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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,877	09/22/2003	Su Tao	TAOS3010/EM	4224

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EXAMINER	
ROSE, KIESHA L	
ART UNIT	**PAPER NUMBER**
2822	

DATE MAILED: 09/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/664,877	TAO, SU	
	Examiner	Art Unit	
	Kiesha L. Rose	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the amendment filed 1 July 2005.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4-6 and 8-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Huang et al. (U.S. Publication 2002/0113308).

Huang discloses a ball grid array (Fig. 1) that contains a substrate unit (20) having an upper surface and a lower surface opposed to the upper surface, a chip (21) having an active surface and a back surface opposed to the active surface, a plurality of conductive devices (wires (22)) electrically connecting the active surface of the chip and the upper surface of the substrate and the back surface of the chip is attached on the upper surface of the substrate, a plurality of pellets (230) formed on the upper surface of the substrate and surrounding the chip, a heat spreader unit (231) disposed above the chip and the pellets, wherein the heat spreader is connected to the pellets, a plurality of solder balls (24) formed on the lower surface of the substrate and an encapsulation unit

(25) encapsulating the chip, conductive wires, pellets and heat spreader unit, where the pellets are thermally conductive bumps, thermally conductive adhesive bodies, thermally conductive adhesive bodies with metal powder therein or electrically conductive bumps.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of Bertin et al. (U.S. Patent 6,294,406).

Huang discloses all the limitations except for the conductive device to be conductive bumps. Whereas Bertin discloses a chip package (Fig. 10) that contains a substrate (140) and a chip (130) with conductive bumps that connect the chip to the substrate and where the conductive bumps are metal bumps or electrically conductive adhesive bodies. (Column 4, lines 62-65) Conductive bumps are used to provide an electrical pathway between the substrate and the active circuit layer of the chip. (Column 4, lines 54-56) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Huang by incorporating conductive bumps as the conductive devices to provide an electrical

pathway between the substrate and the active circuit layer of the chip as taught by Bertin.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of Chen et al. (U.S. Patent 6,649,991).

Huang discloses all the limitations except for the substrate to be organic with a mask. Whereas Chen discloses a semiconductor package (Fig. 1) that contains an organic substrate with a mask layer (110) and grounding contacts; traces in the substrate. The substrate is an organic substrate with a mask to make the substrate extremely flat and with the traces (grounding contacts) formed by the mask the substrate is even and flat, which makes better placement of the chip and greater adhesion between chip and substrate. (Column 2, lines 6-13) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Huang by incorporating an organic substrate with a mask to make the substrate extremely flat and with the traces (grounding contacts) formed by the mask the substrate is even and flat, which makes better placement of the chip and greater adhesion between chip and substrate as taught by Chen.

Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of McMillan et al. (U.S. Patent 5,650,593).

Huang discloses all the limitations except for a leadframe and lead less lead frame. Whereas McMillan discloses a chip carrier package (Fig. 9) that contains a substrate (12) which can be a leadframe or a leadless lead frame and a heatsink (16). Whereas with the substrate being a leadless leadframe will reduce the amount of heat

are used to bond things together. Therefore the Huang reference discloses the claimed limitations and the rejection stands.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 571-272-1844. The examiner can normally be reached on M-F 8:30-6:00 off 2nd Mondays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

that will be carried away from the chip by the lead frame itself. (Column 3, lines 18-22) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Huang by incorporating a leadframe and leadless leadframe to reduce the amount of heat that will be carried away from the chip by the lead frame itself as taught by McMillan.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of Bernier et al. (U.S. Patent 6,251,707).

Huang discloses all the limitations except for a chromium layer on the heat sink. Whereas Bernier discloses a chip carrier (Fig. 1) that contains a heat sink (118) with a chromium layer formed thereon. The chromium layer is formed for chromate conversion on the heat sink and for oxidation. (Abstract) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Huang by incorporating a chromium layer on the heat sink for chromate conversion and for oxidation as taught by Bernier.

Response to Arguments

Applicant's arguments filed 1 July 2005 have been fully considered but they are not persuasive. Applicant's argues that the Huang reference does not disclose the pellets to be thermally conductive adhesive bodies this is erroneous since the pellets (230) are solder balls, which are thermally conductive adhesive bodies since they can be formed of tin or lead and they are conductive entities and are adhesive since they

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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